

**TECHNICAL MEMORANDUM
WRE # 357**

**THE EXPERT ASSISTANCE PROGRAM, 1993-1997:
PROGRAM PROCEDURES AND PROJECTS**

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By

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Executive Summary

An Expert Assistance (EA) Program was initiated in 1993 to provide short-term, technical consultation and collaboration to assist in problem solving and product completion for the South Florida Water Management District. From its inception in 1993, through 1997, the Program has been utilized for 230 projects involving 191 prequalified experts from a pool that grew from 109 experts in 1993 to 380 in 1997, and now encompasses 66 fields of expertise. Funds expended through the Program totaled \$1,328,624 during fiscal years 1993 through 1997, with an average hourly consultation cost of \$86.01, which includes travel. The vast majority (84%) of experts selected from the pool each year were used just once and the number of experts used two or more times each year has been reduced to less than 8% for the last two fiscal years. The Expert Assistance procurement process uses Purchase Orders, which has proven to be an efficient form of contracting for technical services to meet short-term and specialized needs. This 8-step process also differs from conventional District contracting in providing technical quality control and project oversight by agency staff separate from those requesting assistance.

Approximately two-thirds of Program funds have been spent for projects within the Ecosystem Restoration Department. The Water Resources Evaluation Department used 22% of Program funds with the remainder going to projects within four other departments. In total, consultations in ecological science accounted for 30% of EA projects, and advanced statistics and model development each consumed about one-fifth of the EA budget. Just over 21% of funds have been applied to technical review, followed by hydrological science at about 8%. Viewed geographically, Program spending was greatest for Lake Okechobee and its watershed (36%) and approximately one-half as much for the Everglades (19%). The Kissimmee River (13%) and other areas (35%) consumed the remaining funds. EA Projects conducted during FY1996 (Appendix Table 1) illustrate the diversity of Program applications and accomplishments; projects range from peer reviews often costing less than \$3000, to projects involving model development and intensive technical assistance costing more than \$20,000. The Program also supported workshops, review panels and highly specialized training for staff. As the District reengineers for greater productivity under budgetary constraints, the Expert Assistance Program will continue to provide a means of accomplishing high priority, technical assignments both rapidly and with a high level of credibility.

Background

The Water Resources Evaluation Department administers an Expert Assistance Program to allow staff of the South Florida Water Management District (District) to employ experts in over sixty different fields for rapid-response, technical assistance. The Program is designed to solve technical problems, speed the development of technical tools and provide specialized help in analyzing water resource information. It is a realistic and practical means for increasing the flow of information from District research and monitoring activities, for improving credibility, and for strengthening the basis of water management decisions in the process. This publication provides a brief description of the Expert Assistance Program as it exists after five years of operation, and documents key accomplishments and summary statistics for the 1993 - 1997 period.

The Expert Assistance Program dates from 1992 when executive management recognized the need to provide specialized and highly credible assistance to staff professionals charged with conducting time-sensitive, technically challenging scientific work with limited financial and staff resources. Even a well-trained, highly professional staff can not be expected to deal effectively with the wide array of technical demands in a modern resource management agency. Senior District management also recognized that conducting standard contracting is not practical for critical, short-term needs, and that hiring additional technical staff is not always appropriate to meet ever-changing information needs in an era of increasing pressure on the agency's financial resources. Having a cadre of experts available on an as-needed, rapid-response basis to assist staff and provide expert review and guidance was seen as a viable option to deal with urgent technical information needs in water resources management.

Neither a search of the scientific literature nor personal communication with professional colleagues provided examples of an expert assistance process, so the District program was developed *de novo* through the cooperation of District technical and administrative staff. Technical staff helped to define areas of needed expertise and provided an initial set of potential experts to be solicited. Administrative professionals developed a procurement process using Purchase Orders to obtain technical services, and guided the design of a solicitation process to develop the pool of pre-qualified expert vendors. The resulting Program makes expert help available to agency staff in a process that typically requires only a small fraction of the investment made in most agency projects. The Program is designed to provide solutions and remove technical obstacles with minimal

administrative overhead, and it is available to all District departments. The Program is not set up specifically for legal purposes, although some issues addressed by experts may have legal relevance. However, it is a primary means for conducting technical review of District programs, projects and products.

Expert Assistance is distinct from traditional contracting in that it operates through Purchase Orders (POs) which are limited to 4 months duration and a maximum of \$25,000 per issue, and are accompanied by detailed scopes of work with very specific deliverables and timelines. Implementation of the Program is supported by the commitment of just over one FTE and a custom ORACLE® database to aid in Program administration and to facilitate use of the expert pool.

Standard Operating Procedures of the Expert Assistance Program

The Program consists of a pre-qualified pool of experts and a procurement process for their services. A **Standard Operating Procedure (SOP)** (**Appendix 1**) guides the development of the Pool and the procurement of services. The Expert Pool, which has grown from 109 experts in FY 1993 to 380 in 1997, was derived from a yearly Request for Proposals with nationwide advertising in professional journals. Each year when the Pool is opened, experts are sought in a suite of particular disciplines to improve technical coverage of the Program. Applicants to the Pool are qualified through a review of their written credentials by an internal committee using six criteria:

- expertise as evidenced by refereed publications and technical reports;
- experience in applied science relevant to agency needs;
- service to professional organizations;
- project management experience;
- reasonableness of hourly consulting rate; and
- minority status of the expert.

Applicants are scored independently by 3 committee members (12 members total) and their ratings are then discussed by the committee as a whole. Applicants are admitted to the Pool based on their final rankings after the committee discusses each application and agrees on how to interpret materials documenting accomplishments. The areas of expertise of qualified experts are then entered into the Program database. This database allows staff to locate specialized expertise by a computerized search. Resumes for all qualified experts are kept by the Program to aid in locating

appropriate experts.

In order to use short-term Purchase Orders to contract for professional services, the EA Program follows a unique procurement process (see SOP, **Appendix 1**). The main steps in this process are outlined in **Figure 1**, and are accomplished through a series of interactions between the staff of the EA Program and professionals requesting assistance. A District staff member provides a description of the expertise needed and justifies a need for expert help by submitting a Request for Assistance (RFA) (**Step 1**). This document, usually 5-7 pages long, contains background information, a description of project tasks and deliverables, a list of responsibilities of the requesting division, a set of criteria for accepting deliverables, a schedule for tasks and deliverables, and approvals by the requesting division / department and the Water Resources Evaluation Department. These approvals assure that the work is urgent, important and appropriate for the Program.

It is important to emphasize that the EA Program is **not** a substitute for contracting. Therefore, Requests for Assistance developed in **Steps 1 and 2** (**Figure 1**) must: 1) have time frames of no more than 4 months; 2) cost less than \$25 K; 3) involve some degree of direct partnership with District staff; and 4) have a limited number of tasks and deliverables. While it may be possible to procure some expert services within these time and funding constraints using conventional contracting, it would not be cost-effective to do so.

Steps 1 and 2 (**Figure 1**) lead to a final Request for Assistance and can involve substantial time for both Program and requesting staff (ca. 4 to 8 hours). The technical quality assurance (**Step 2**) is the result of review and revision of each project by EA Program staff and distinguishes the EA process from traditional procurement. The official Scope of Work to accompany the Purchase Order is developed by revising and reformatting the Request for Assistance. Once the request is approved, the requesting professional selects potential experts from the pool in cooperation with Program staff. When several experts are found to be qualified and available to handle a particular request, selection is based on hourly cost, minority status and staff preference (**Step 3**). During FY 1993 and 1994, there were not multiple experts equally qualified for most projects due to the specialized nature of requests and the relatively small number of experts available from the Pool. However, as the Pool has expanded to the present level of 380 experts, there are currently only a few instances in which there are not several experts capable of doing a specific project. This allows the Program to effectively 'compete' each project within the EA Pool, and three or four experts are

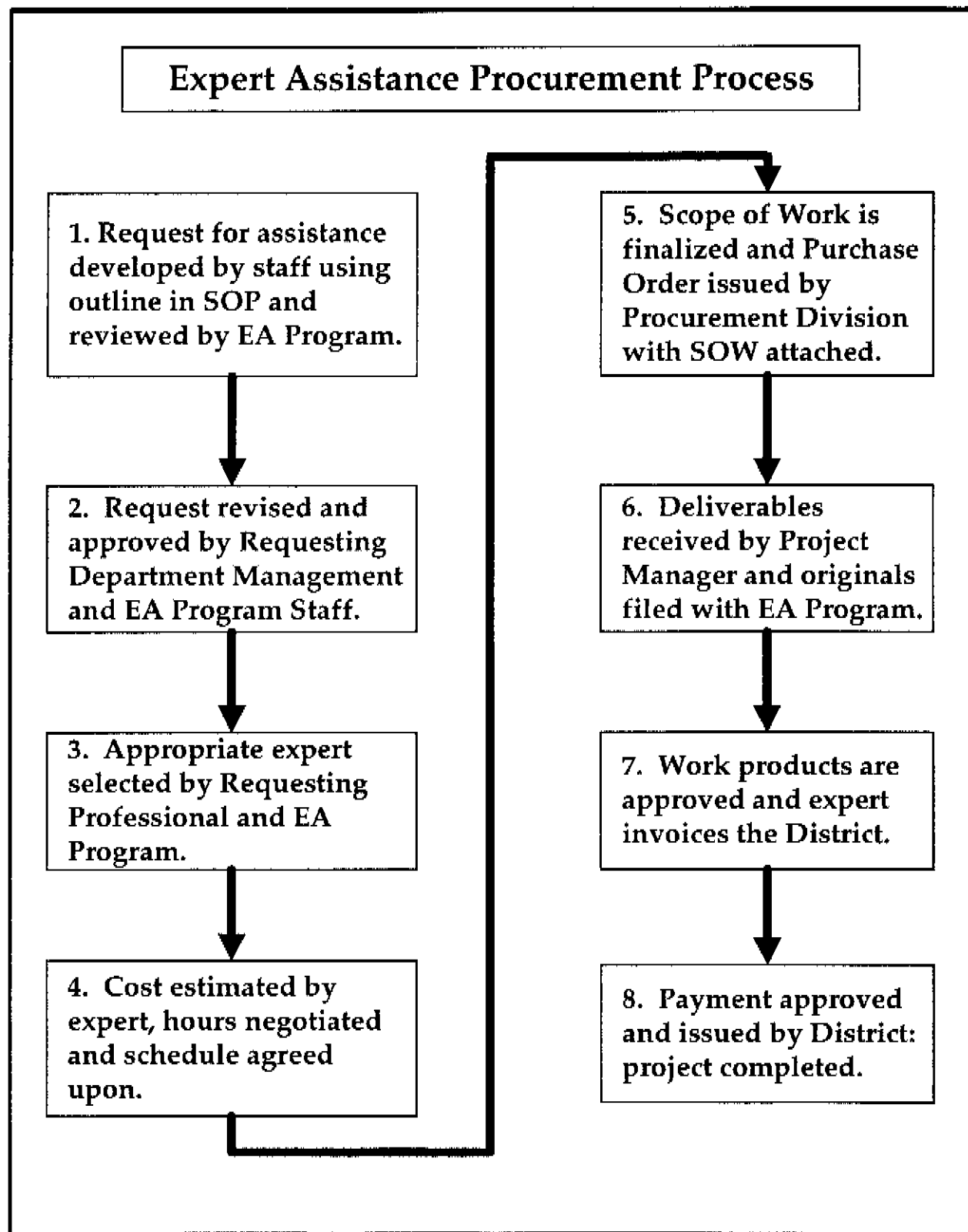


Figure 1. A schematic summary of the Standard Operating Procedure (SOP) for procuring services through the Expert Assistance Program.

now considered for the typical project. Once selected, the expert is contacted by Program staff, and if available and willing to do the work, he/she is asked to provide cost estimates by task for the EA project (**Step 4**). Individual POs are not bid competitively through the usual procurement process. This cost estimation is in the form of the number of hours for the expert to complete each task in the Scope of Work. After negotiation of hours, schedule and other specific aspects of the project with the expert, Program staff finalize the Scope of Work and use it as the basis for issuing the Purchase Order for services.

Purchase Orders are issued via standard procurement procedures (**Step 5**) and they commit the agency to a fixed-cost for project tasks. At this point, the requesting professional becomes the Project Manager for the PO. Total costs are computed from an adjusted hourly rate, with travel costs added to the total cost of consultation and divided by the number of expert consulting hours. Payments are based on deliverables (**Steps 6 and 7**), and there are typically 1-2 payments scheduled per project. The Project Manager makes specific arrangements for site visits by the expert, tracks performance on tasks and deliverables, and provides District support to the expert to assure that the project is completed as agreed upon in the Scope of Work. Once all deliverables and invoices are approved, payment is made and the project is completed (**Step 8**).

Each expert and every project in the Program provides information for the EA database. Master files are kept for each project and contain copies of Scope of Work, deliverables, Purchase Order, etc. An ORACLE®-based tracking system is used to organize information on areas of expertise, records of each Request for Assistance, deliverables for each project, travel expenses and invoice tracking. A variety of summary reports can be provided from this database to summarize Program activities by: deliverable type or District work unit; areas of expertise utilized; and work performed by individual experts.

Expert Assistance Projects, FY 1993 - 1997

Between 40 and 52 POs have been issued each fiscal year through the EA Program for a total of 230 projects over five years (**Table 1**). A total of 21 projects have been conducted by minority experts and Program staff seek to increase this proportion through active recruitment of minorities into the Pool, together with the priority use of minorities during the selection process. There have been 22 POs solely for publication, in which an expert cooperates in the analysis of District data,

Table 1. A statistical summary of the Expert Assistance Program, Water Resources Evaluation Department, for fiscal years 1993 through 1997. The upper panel provides data on Purchase Orders, the middle panel summarizes consulting hours purchased and costs, and the bottom panel outlines information on the usage of the expert pool.

Category	FY1993	FY 1994	FY 1995	FY 1996	FY 1997	TOTAL 1993-97
Purchase Orders (POs)	49	48	52	40	41	230
PO's to Minorities	1	4	5	5	6	21
PO's for Publication	2	6	5	6	3	22
PO's for Workshops	18	7	5	6	8	44
Hours Purchased	2981	2889	3183	3735	2660	15,448
Ave. Cost/hr (incl. travel)	\$86.29	95.81	83.77	80.27	85.77	\$86.01 (5yr.ave.)
Annual Expenditures	\$257,227	276,788	266,644	299,815	228,150	\$1,328,624
Experts Used per Year	38	35	42	38	38	
Used Once	28	25	36	36	35	
Used Twice	9	7	3	2	3	
Used 3 X	1	3	2	0	0	
Used 4 X or more	0	0	1	0	0	
Experts in Pool	109	223	288	336	380	

often archived monitoring data, and publishes the work in the open literature with a District professional. This type of project is mutually beneficial: the agency gets rapid analysis and publication of its data, while the expert is able to diversify his/her portfolio through the project. It is important to note, however, the most technical publications of the District do not involve Expert Assistance; the Program simply gives staff another vehicle for getting information to the public more rapidly than would otherwise be possible. The EA Program also assists the District in contracting with experts (44 POs) to participate in various workshops to provide review and guidance to the agency in an interactive setting. Workshops done in cooperation with other agencies have added value promoting professional collaboration.

Experts have provided about 15,000 hours of assistance through the Program over 5 years at an average cost of \$86.01 per hour, including travel expenses (Table 1). Considering the caliber of specialized, highly qualified expertise being furnished, the rapid response nature of the Program and its minimal administrative overhead, this hourly rate is very reasonable. Expert Assistance has been allocated about \$250,000 each year through the District's budget process. Some additional expenditures in the 5-year total (\$1,328,624) were derived from contributions to the Program from other budget categories, including those of other departments within the agency.

Over one hundred individual experts have been contracted through the Program since its inception (Table 1). The vast majority of these experts have been used just once or twice over this 5-year period. The Program discourages the repeated use of the same individuals and has been able to offer alternative experts to requesting professionals as the Pool has expanded over the five-year history of the Program. The use of individual experts on multiple projects is approved only when it would not be cost-effective to bring a new expert into a particular project or when there are no viable alternative experts in the Pool. With 380 professionals currently in the Expert Pool (Appendix 3), the Program can provide alternative experts for most projects, and the number of experts used more than once per year has dropped from 10 in FY 93 and 94, to 2 or 3 in FY 96 and 97. The Pool has experts in 66 disciplines, and experience suggests that a pool of at least this magnitude is needed to satisfy the District's diverse needs for technical assistance and peer review.

To examine the type of assistance provided through the Program, POs were placed in 1 of 5 categories; a summary of the resultant data is provided in Figure 2. Ecological science was the most active discipline with expenditures accounting for 30% of the total. Projects in this category include those involved with wetland science, nutrient/metals cycling, limnology, taxonomy and river ecology. Advanced statistical analysis represented over \$200,000 in project costs (21%) and included

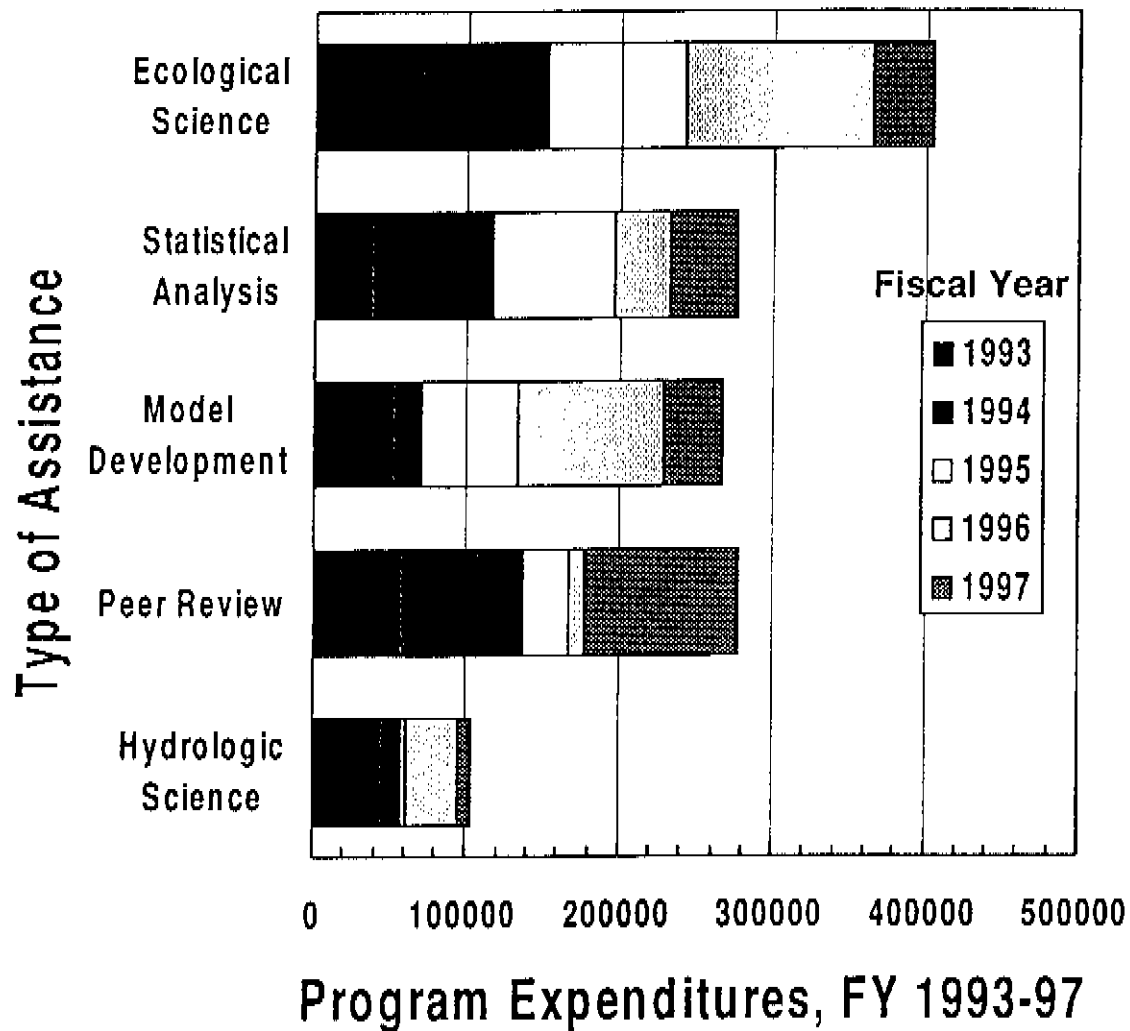


Figure 2. Expenditures of the Expert Assistance Program presented by the type of assistance provided and fiscal year of the project. Examples of the usual types of assistance are given in the text and a complete listing of projects is provided for 1996 in Appendix Table 1.

projects on monitoring design, water quality data analysis, empirical model development and guidance on experimental designs. Model development was also allocated over \$200,000 since 1993 (20%) for projects such as modifications and expansions of the District's surface- and groundwater models. Another major use (21%) of the Program was for peer review of agency projects, products, and programs. The Expert Assistance Program provides the means to locate reviewers and pay for their services within the short timeframes often required for reviewing. The fifth category, hydrologic science, includes analysis of monitoring networks and guidance on hydrological calibrations, and involved 8% of Program funds.

EA Projects concerning Lake Okeechobee and its watershed were allocated 36% of Program funding during the 1993-1997 period (Figure 3). Expert Assistance was used aggressively by District staff associated with research and monitoring on the Lake, and has been proven to be ideally suited to support the concentrated effort to analyze and publish the large data sets amassed on the Lake and its drainage basin since 1988. Technical activities in the Everglades were concentrated more on planning and project initiation during this same period of time, providing fewer opportunities for collaboration with experts than for Lake Okeechobee. Everglades projects represented about 19% of available funds. EA projects on the Kissimmee River Restoration have been supporting this large effort consistently over the last 5 years, totaling 13% of funds. EA allocations to the Everglades Agricultural Area have been focused largely on regulatory support during 1995 and 1996, using just 8% of funds.

Expenditures for Expert Assistance are presented for organizational units within the District in Figure 4. Okeechobee Systems Research Division has used the Program more than any other group (38% of total funds) and has done so quite consistently each fiscal year. Utilization of the Program by the Everglades System Research Division amounted to about 17% of the total, but actually declined in use after 1995. Projects done through the Resource Assessment Division, Water Resources Evaluation Department, are listed separately from WRE in Figure 4 since this division often provides District-wide support for peer review, workshops and technical assistance; these activities accounted for about 13% of the total funds. Finally, Figure 4 reflects an expansion of the number of client departments using the EA process since FY 1995; Water Resources Evaluation, Regulation, and Planning Departments have become significant users of the program.

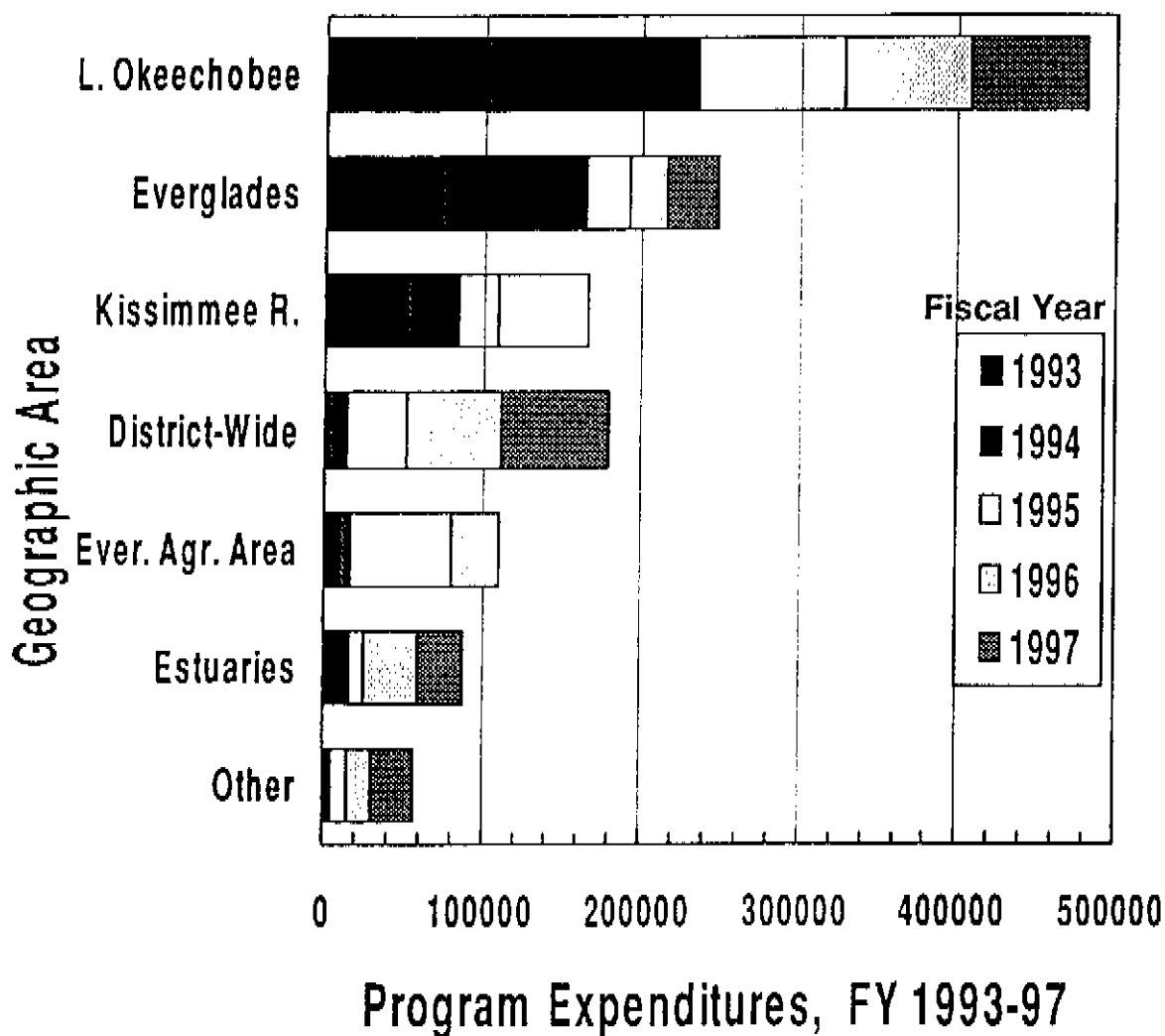
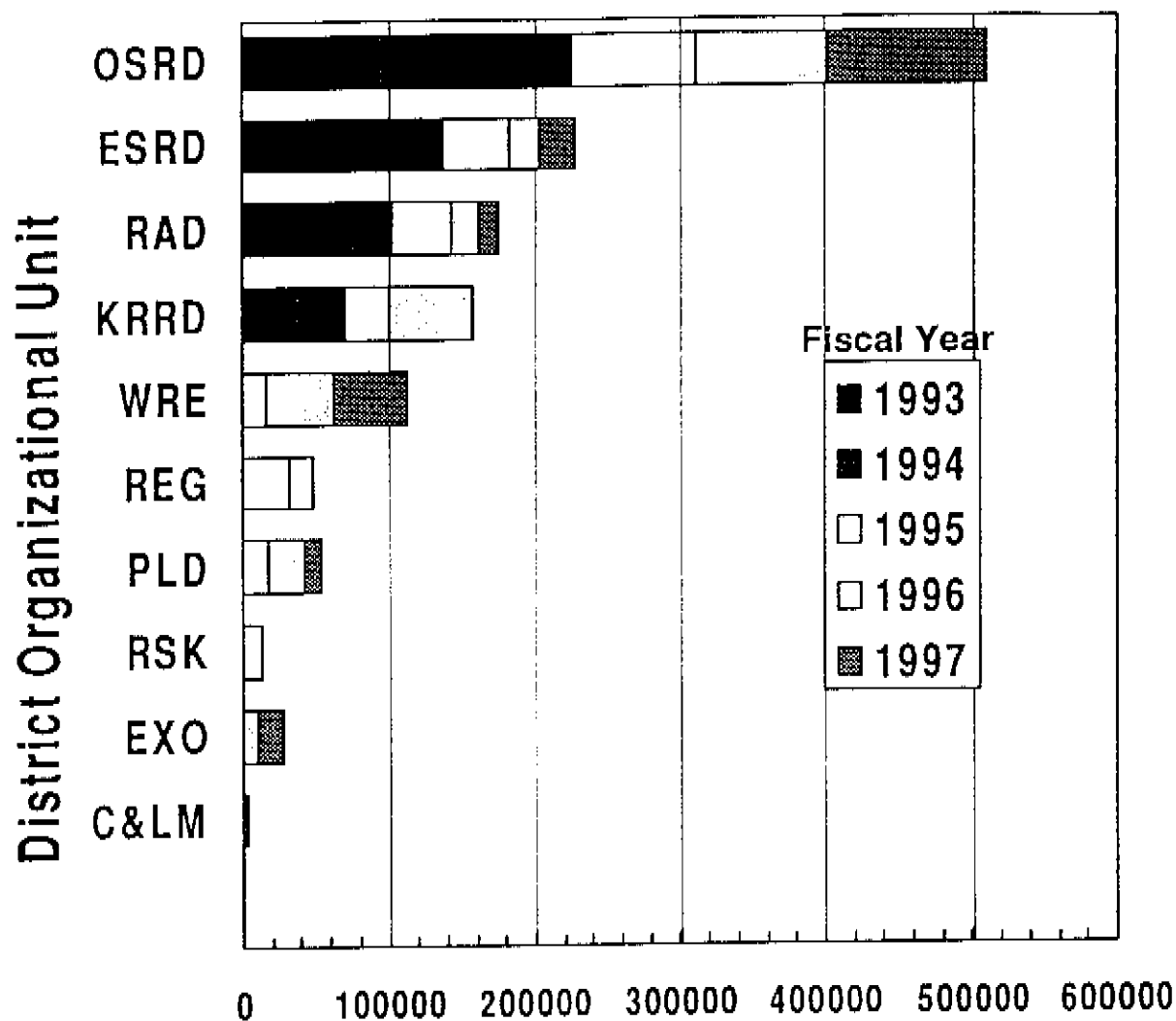


Figure 3. Expenditures of the Expert Assistance Program presented for major geographic areas of South Florida and by fiscal year. Project costs are associated with an area based on application of the analysis done; when the products can be applied to any geographic area, they are included under the District-wide category.



Program Expenditures, FY 1993-97

Figure 4. Expenditures of the Expert Assistance Program by organizational unit within the District and by fiscal year. Projects are categorized by the unit requesting assistance. Projects included as WRE are those requested from units other than WRE's Resource Assessment Division.

C&LM = Construction and Land Management Department;

OSRD = Okeechobee Systems Research Division;

ESRD = Everglades Systems Research Division;

RAD = Resource Assessment Division;

KRRD = Kissimmee River Restoration Division;

WRE = Water Resources Evaluation Department;

REG = Regulation Department;

PLD = Planning Department;

RSK = Risk Management Division; and

EXO = Executive Office.

Support for Panels and Workshops

One-fifth (44) of the POs issued by the Program over the last 5 years have involved panels or workshops. Several major review panels have been conducted by using the EA process to locate and procure expert services. Prime examples of panels and workshops include:

- 3 experts served as facilitators and reporters for a workshop on the synthesis of Lake Okeechobee watershed phosphorus research;
- 2 experts to lead a multi-agency workshop on uncertainties in the South Florida Water Management Model and the Natural Systems Model;
- 4 experts advised the District on plans for evaluating the restoration of the Kissimmee River in association with a standing scientific advisory panel for the project;
- 4 experts collaborated with staff in developing conceptual models for evaluation of the Kissimmee River restoration and published these models in an issue of the international journal, *Restoration Ecology*;
- 2 experts served on a panel to evaluate proposed numerical criteria for drawdown of aquifers for wetland protection;
- 3 experts served on separate panels evaluating research activities in Florida Bay and
- 4 experts facilitated a District-sponsored conference on atmospheric deposition of nutrients into south Florida and provided a report on key issues, findings and future needs for this important source of nutrients.

Many of the technical challenges facing the District are multi-disciplinary. The ability to use several experts at one time to review or advise on programs and projects has proven to be a very effective means of peer review and guidance, particularly since experts are available to interact directly with District staff and interested members of the public. Public involvement with panels can be an excellent means of improving understanding of complex issues and bolstering trust in resource management decisions at the same time. Panels on water quality issues concerning Florida Bay, Lake Okeechobee and atmospheric deposition are good examples of the use of EA to deal with such important issues. It is quite time-consuming for District staff to arrange for panels and workshops, however, and staffing constraints require that professionals requesting multiple experts for panels and workshops collaborate closely with staff of the Expert Assistance Program in conducting these projects.

Expert Assistance in FY 1996: A Closer Look at Projects and Products

To illustrate the diversity of activities done through Expert Assistance, **Appendix Table 1** contains a complete listing of EA projects conducted during FY 1996 including associated costs and benefits to the District. Of the 40 POs issued during FY 1996, six facilitated publication and six directly supported workshops. Projects in FY 1996 were typical of the range of areas addressed through the EA Program. Among the notable projects conducted during FY 1996 are (pages ref. Appendix Table 1):

- evaluation of the Kissimmee River avian community monitoring project (p. 35);
- peer review of minimum flow estimates for the Caloosahatchee Estuary (p. 35);
- peer review of minimum flows and levels for the Lower East Coast area (p. 36);
- risk assessment and bioremediation on acquired Chemairspray properties (p. 36);
- verification of wind-wave model for Lake Okeechobee (p. 37);
- software development of applications for permit BMP data evaluation (p. 37);
- assuring the adequacy of models used to assess sampling networks in south Florida (p. 38); and
- identifying invertebrates from the Caloosahatchee Estuary (p.38).

Challenges for FY 1998 and Beyond

The Expert Assistance Program will continue to adapt to changing agency needs. Program staff must assure that staff professionals understand how to use the Program effectively. Likewise, supervisors should remind their teams to use the Program routinely, particularly when technical problems are complex and require solutions in the short term. Future solicitations for experts must continue to encompass new areas of expertise needed by the District, such as agricultural ecology, advanced stormwater treatment technologies, ecological economics and data management. Better means of data capture and retrieval will be implemented to improve EA project management and tracking. The Expert Assistance Program is expected to continue to diversify and expand its client base, but will be unable to provide services above about 50 projects per year without additional administrative support.

We hope that this report will help to communicate the very real and practical utility of Expert Assistance, and will document the fact that the Program is a tool that only increases in importance and applicability as funding for new staff and contracts becomes severely constrained.

Appendices

- Appendix 1. Standard Operating Procedure for the Expert Assistance Program (5/19/97).**
- Appendix 2. List of Experts available through the EA Program during FY 1997.**
- Appendix 3. Appendix Table 1. A summary of the Expert Assistance projects conducted during FY 1996.**

Appendix 1.

Standard Operating Procedure for the Expert Assistance Program (8/1/97).

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I. Overview - The Expert Assistance Program

The Expert Assistance (EA) Program allows the South Florida Water Management District (District) staff to utilize experts in over 60 different fields for rapid-response technical assistance. The Program is designed to solve scientific problems, speed the development of technical tools and provide specialized help in analyzing water resource information. Expert Assistance is also used for critical review of District programs and projects. The Program brings the additional benefit of staff training and collaboration in specialized and rapidly evolving areas of expertise.

For the Expert Assistance Program, the District locates experts by a Request for Proposals and, after an appropriate screening and selection process, experts are placed in a pool and are available for use through Purchase Orders (POs). After a Statement of Work (SOW) is developed, Water Resources Evaluation (WRE) arranges for experts to work collaboratively with District staff on the specific tasks identified. The EA process provides an efficient means of paying for the professional services of experts using Purchase Orders.

Data analysis and documentation are scientifically demanding and time consuming. As a result, the completion of projects may be delayed and information may not be made available for decision-making in a timely manner. Water Resources Evaluation works with other District staff to overcome such obstacles by the use of Expert Assistance, a program whereby external experts are coupled with District staff to solve problems and bring technical projects to closure in a timely manner. Experts are also used for peer review of District projects in the planning, execution and documentation phases. In addition, experts may be used to synthesize information on special topics, to prepare policy-level documents on key issues and to review a variety of technical programs or products.

Expert Assistance is a realistic and practical means for increasing the flow of water resources information, improving credibility and strengthening the basis for water management decisions. The EA process is also very cost-effective since it requires only a small fraction of the investment made in collecting original data and provides advanced technical assistance without hiring new permanent staff in specialized areas of expertise.

Peer review is a process of using experts to provide timely advice on the quality and relevance of District technical activities. It is a process of information input and continuing education for District staff and is an important means for assuring quality in programs and projects. Water Resources Evaluation coordinates external review across

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all technical areas as needed, using experts from the "pool". The Expert Assistance Pool is an important resource for locating world-class reviewers for District programs and projects over short time frames.

II. Scope of Expert Assistance Projects

The use of Purchase Orders for Expert Assistance is intended only for rapid-response projects with constrained time frames and costs.

The EA program is not a substitute for contracting. Requests for assistance should conform to the following guidelines:

- time frames of no more than four months
- total costs less than 25K
- collaboration with technical staff from requesting Division
- limited number of tasks and deliverables per request
- specificity in tasks, procedures and deliverables.

III. How to Request the Use of Outside Experts

(This section describes how professional staff can acquire the services of outside experts to assist in the production of journal articles, analysis of data, review of critical topics, project guidance etc.)

The procedures for Expert Assistance are as follows:

- A. Professional staff member identifies needed work and the reasons for requesting outside expertise by submitting a Request for Assistance (RFA). Examples of Requests for Assistance are available from WRE. Elements of the RFA are:
 - 1) Tracking Information
 - 2) Introduction (Background of the Project)

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- 3) Scope of Work - Duties and Tasks of Expert
- 4) Description of Expert Assistance by Task
- 5) Responsibilities of Requesting Division
- 6) Evaluation Criteria for Acceptance of Deliverables
- 7) Time Line for Tasks and Deliverables
- 8) Approvals for the EA Project

- B. The requesting professional should work collaboratively with a WRE staff member to develop an RFA. The WRE staff member will assist in developing a successful EA project with the professional. Except for peer review and special requests from Senior Management, WRE does not develop RFAs independently.
- C. The EA Program is an interdepartmental resource. The requesting professional's Supervising Professional, Division Director and Department Director approve or deny the Request for Assistance. If approved, the RFA is then forwarded to WRE for approval. Upon approval of the RFA and the Expert, a WRE staff member will modify the RFA into a SOW. Cost tables and deliverable schedules are added to the SOW. WRE approvals will reflect departmental priorities for use of WRE resources; some requests for assistance may have to be postponed or denied.

IV. How to Select an Expert for Assistance

- A. The Request for Expert Assistance (to include tasks and deliverables) must be approved prior to selection of an expert. Experts from the pool **should not** be contacted by requesting professionals prior to RFA approval.
- B. The list of experts and their areas of expertise is maintained by WRE staff, who assist the requesting professional in locating suitable candidates. Resumes for prospective experts will be provided as needed.
- C. The requesting professional and WRE staff will prioritize the experts that are best suited for the required tasks. Telephone interviews may be a part of the selection process, and availability of experts must be confirmed. If the first expert being solicited is unavailable to do the required tasks, the requesting professional may contact other experts upon approval by WRE.

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- D. In case of disagreement, WRE will make final determination of the expert to be used.
- E. WRE staff will ask the selected expert to complete a form stating the number of hours proposed to be spent on each task. These hours may be negotiated. The hour breakdown must be approved by the Director of WRE and is expected to be reasonable and appropriate for each task.
- F. When selection of the expert has been approved and finalized, the requesting professional will prepare an Expert Selection Memorandum. An outline for this memorandum can be obtained from WRE staff. The requesting professional is requested to justify use of the expert over at least two, preferably three, other candidates from the same area of expertise. This memorandum justifies selection of a particular expert and will be put on file for auditing and tracking purposes to document competition between members of the pool.

V. Use of Experts for Peer Review

- A. The Request for peer review is completed by WRE staff. The RFA must include a brief description of the product that is to be reviewed and specific questions to be answered.
- B. WRE is responsible for selecting peer reviewers, but will consult professionals in the originating Division for recommendations. WRE staff will determine the number of hours to be spent on peer reviews. The number of hours will be consistent for experts reviewing the same product.
- C. WRE will arrange for the reviews and verbatim copies will be distributed to the requesting Division. In most cases, peer reviews will be completed within four weeks of WRE approval.

VI. Purchase Order and Invoice Procedure

WRE staff will be responsible for submitting Purchase Orders to Procurement and Contract Administration (PROCAD) and will also track POs and invoices. Upon final approval of the RFA, expert selection and total cost by the WRE Director:

- A. WRE staff will enter request for Purchase Order (Rx) into the LGFS system.

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B. The designated Contract Administrator will handle all POs and invoices pertaining to the EA Pool.

C. The first statement on the text portion of the Rx will read:

"This Rx is applicable to contract solicitation C-6631 (or C-7689 or C-8691). The contract manager is [name of designated contract administrator]."

This will alert personnel who pull the Rx to route it to the designated contract administrator for processing.

D. Travel cost for experts will be based on District hotel rates and allowable per diem and will include airfare estimates by the WRE Department travel coordinator for those experts who need to fly. Experts will be given per diem to cover breakfast, lunch and dinner for each day they spend working at the District. Experts will be reimbursed 50% of their hourly consulting rate for time spent in travel to and from the District.

E. Payments to experts will be on a fixed-cost, lump-sum basis. The total costs will be computed as the product of an adjusted hourly rate times the number of expert assistance hours (not including travel time). The adjusted hourly rate will be the sum of the expert assistance fee and total travel costs divided by the expert assistance hours. (The expert assistance fee is the certified hourly rate multiplied by the expert assistance hours.)

F. WRE will route the SOW including the cost tables and payment schedule to the designated contract administrator when the Rx is submitted. The designated contract administrator will issue the PO, send it to the expert and once the signed copy is returned; notify WRE by sending the original signed Requestor copy to Program Staff.

G. The Purchase Order will include the following:

- SOW, deliverable and payment schedule
- Terms and conditions statement
- Statement for expert's signature that the expert accepts and understands the terms and the schedule

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- Section stating that the expert will mail the invoices to the designated contract administrator

-The special coding system for EA Purchase Orders is as follows:

PC C-6631-xxxx, PC C-7689-xxxx or PC C-8691-xxxx (depending on the solicitation number the expert qualified under)

xxxx = an assigned suffix of 4 digits to be assigned by the designated contract administrator. The code number will alert anyone receiving invoices concerning the EA Pool to route it to Contract Administration.

- H. Invoices will be sent to the designated contract administrator. The Contract Payment Authorization (CPA) and the original invoice will be sent to Program Staff for signature approval. WRE will return the signed CPA and invoice to the designated contract administrator for processing and payment.

VII. How to Monitor the Use and Performance of Outside Experts

The requesting professional or his designee will serve as Project Manager for each RFA. The Project Manager and the WRE representative will work together on scheduling the activities listed below. The Project Manager will report to Program Staff when the time line milestones have been accomplished. WRE will keep a tracking sheet of activities for each Purchase Order, flag any deadlines that are close to the due date, and collaborate with the Project Manager when problems arise.

- A. Prior to the start of an expert's involvement, the Project Manger should accomplish the following:
1. Provide the expert with pertinent information, data and background material on the project with enough lead time to prepare well for work at the District.
 2. Before an expert arrives, make appropriate arrangements to facilitate any needed technical interactions with the District including such items as arranging for computer access, desk space and field trips.

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3. Ensure that staff members who will be interacting with the expert while at the District have scheduled their time accordingly and will be available while the expert is here.
- B. Once the expert is working collaboratively on location or elsewhere, the Project Manager, with WRE cooperation, will:
1. Provide continuing support to assure time lines are met.
 2. Track deliverables and evaluate acceptance.
 3. Keep WRE informed of progress and problems.
- C. Upon completion of tasks in a particular Expert Assistance SOW, WRE staff will:
1. Assure payment is made to the expert.
 2. Facilitate the publication of project results.
 3. Complete files on the project to ensure documentation of project activities.

VIII. Record Keeping Procedures - Tracking

Staff from WRE will be responsible for overall tracking of each PO for Expert Assistance. An ORACLE-based tracking program has been developed with assistance from the Information Resources Division and an outside contractor. The Expert Assistance will track the following:

- A. Expert Biographical Information (includes the following for each expert):
- Primary contact (address, phone, FAX)
 - Remittance address (address, phone, FAX and remittance name)
 - SS#/Tax ID #
 - Professional affiliation
 - Areas of expertise
 - Hourly consulting rate
 - Vendor #
 - Minority status
 - Year to date (by FY) total dollars committed by EA program

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B. Requests for Assistance (includes the following for each request):

- Request ID# (generated by database)
- FY
- Request date
- Requesting professional
- Project name
- Benefit of project to the District
- Request approval date
- Expertise category
- Expert selected
- Date of expert selection approval

(In some cases there will be multiple experts, areas of expertise and Purchase Orders for an individual Expert Assistance Request)

C. Deliverables Per Individual Purchase Order:

- Request ID#
- Purchase Order #
- FY
- Requesting professional
- Expert name and SS#
- Project Name
- Deliverable List: category (type of deliverable), hours and cost per task, due date and completion date
- Adjusted hourly rate

D. Travel Expense Worksheet: (includes the following information per PO; travel totals are calculated directly and, in combination with the consulting fee total, is incorporated into an adjusted hourly rate)

- Airplane fare (when applicable)
- Hotel cost
- Per diem (breakfast, lunch and dinner)
- Travel rate (hours spent in transit x 50% hourly consulting rate)
- Mileage (if expert travels by car)

E. Purchase Order Information:

- Request ID #

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- Requesting Professional
- Expert name and SS#
- Expertise area
- Rx # and issue date
- PO # and issue date
- Total dollar amount

F. Invoice Tracking:

- Invoice # and dollar amount
- Dates invoice received by WRE and PROCAD
- CPA approval date
- Payment date

IX. Database Summary Reports

These reports are generated by the Expert Assistance Database and can be sorted by FY or Total Time Period. They are also available upon request from WRE.

A. RFA Detail Listing:

Detailed report for each RFA and/or PO; includes RFA Approval Log, deliverable schedule (hours, cost, due dates, completion dates, invoice payments), comments on deliverables.

B. RFA LOG: Record of RFAs and SOWs issued:

Summary reports of each RFA and SOW by FY. Includes "on time" information for each deliverable, invoices paid and PO end dates.

C. Distribution of Work by Category:

Breakdown of deliverable type and cost by Division. Includes totals for each deliverable category.

D. Expert Summary:

List of each expert used. Includes RFA #s and cost breakdown per individual.

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E. Areas of Expertise Used:

Summarizes usage of expertise categories by Division.

F. Totals Summary: (Count/Cost)

Breakdown of total number of RFAs, POs, cost, number of experts used and FTEs purchased by each Division.

G. Time Performance Summary:

Reports average time (in days) for RFA submission to PO, average time from RFA approval to PO, mean cost per PO, and average time from invoice approval to payment by Division.

H. Time Performance Summary for Requesting Professionals:

Reports average time (in days) for RFA submission to PO, average time from RFA approval to PO, mean cost per PO and average time from invoice approval to payment. This report is broken down by requesting professionals.

I. Invoice Report:

Summarizes information for each invoice. Includes invoice amount, WRE and PROCAD receipt dates, CPA approval date and payment date. Invoices are grouped by RFA # and PO #.

J. Missing Information Report:

Summarizes all information available for each RFA and PO and is equivalent to a combination of an RFALOG report and invoice report. This report is used to audit the database for missing information.

H. Financial Report (On Screen ONLY):

This report appears on screen only. Reports total encumbered funds and total paid per FY.

Appendix 2.

List of experts available through the EA Program during FY 1997.

Aelion, C. Marjorie - University of South Carolina
Alcivizon, William - University of California
Alexander, Martin - Cornell University
Allen, Charles M. - Northeast Louisiana University
Ames, Peter L. - HARZA Engineering Company
Andersen, Peter F. - GeoTrans, Inc.
Anderson, David L. - University of Florida
Anderson, Loran C. - Florida State University
Aneja, Viney P. - North Carolina State University
Armstrong, Neal E. - The University of Texas at Austin
Arnold, Jeffrey G. - USDA-ARS
Baker, Lawrence A. - Arizona State University
Beaver, Donald L. - White Water Associates, Inc.
Beaver, John R. - Beaver Schaberg Associates, Inc.
Behrens, Jon S. - Jon Behrens & Associates, Inc.
Belanger, Thomas V. - Florida Institute of Technology
Bell, Harry F. - Environmental Information Strategies
Benfield, Mark C. - Louisiana State University
Benke, Arthur C. - University of Alabama
Benson, William H. - The University of Mississippi
Bhat, Mahadev G. - Florida International University
Bierman, Jr., Victor J. - LTI-Limno-Tech, Inc.
Bildstein, Keith L. - Hawk Mountain Sanctuary
Bloom, Nicolas S. - Frontier Geosciences, Inc.
Blumberg, Alan P. - HydroQual, Inc.
Boers, P.C.M. - RIZA
Boggess, Carolyn Fonyo - Independent Consultant
Boggess, William G. - University of Florida
Bostock, Helen - DATA_DIRECT
Botkin, Daniel B. - Center for the Study of the Environment
Bott, Thomas L. - Academy of Natural Sciences of Philadelphia Stroud Water Research Center
Boyer, Joseph N. - Florida International University
Boyle, Carolyn R. - Mississippi State University
Boynton, Walter R. - University of Maryland
Branscome, Lee E. - Environmental Dynamics Research, Inc.
Brazil, Larry E. - Riverside Technology, Inc.
Breidt, F. Jay - Iowa State University
Bridges, Edwin L. - Fairchild Tropical Garden
Briggs, John M. - Kansas State University
Brix, Hans - University of Aarhus
Brock, James T. - Rapid Creek Research, Inc.
Browder, Joan A. - NOAA
Burnett, Alister - Florida Atlantic University
Burns, Karen M. - Mote Marine Laboratory
Burrows, David R. - University of Georgia - Savannah River Ecology Laboratory
Campbell, Ian - Manash University
Carney, Heath J. - University of California at Davis
Carroll, Joseph D. - Carroll and Associates
Cecilio, Catalino B. - Independent Consultant
Cederberg, Gail A. - GeoTrans, Inc.
Chanton, Jeffrey P. - Florida State University
Chen, Der-San - The University of Alabama
Chen, Hui-Chuan - The University of Alabama
Childers, Daniel L. - Florida International University
Chin, David A. - University of Miami
Cohen, Arthur D. - University of South Carolina
Collard, Sneed B. - Independent Consultant
Collier, Hughbert A. - Tarleton State University
Conner, William H. - Clemson University
Cooke, Dennis G. - Kent State University
Cooper, Lee W. - Oak Ridge National Laboratory
Coultas, Charles Lynn - Independent Consultant
Crecelius, Eric A. - Battelle
Cressie, N.A.C. - Iowa State University
Cuker, Benjamin E. - Hampton University
Cutter, Gregory A. - Old Dominion University
Dahm, Clifford N. - National Science Foundation
Dalrymple, George - Everglades Research Group, Inc.
Day, Gerald N. - Riverside Technology, inc.
DeBusk, Thomas A. - Azurea, Inc.
DeLaune, R.D. - Louisiana State University
DeVries, Dennis R. - Auburn University
Di Toro, Dominic M. - HydroQual, Inc.
Dierberg, Forrest - Aqua Chem Analyses, Inc.
Dixon, L. Kellie - Mote Marine Laboratory
Dixon, Philip M. - Independent
Dodds, Walter K. - Kansas State University
Dolan, Rebecca W. - Butler University
Donigian, Jr., Anthony S. - AQUA TERRA
Donnelly, Maureen A. - Florida International University
DuBow, Paul J. - Texas A&M University
Duever, Michael - Nature Conservancy
Duke, Clifford S. - CommonSense Environmental, Inc.
Dunson, William A. - Penn State University
Dzurik, Andrew A. - Florida State University
Edwards, Randy E. - Mote Marine Laboratory
Eisenreich, Steven J. - Rutgers University
Eisner, Wendy R. - Byrd Polar Research Center
Elwany, M. Hany - Coastal Environments
Englehardt, James D. - University of Miami

Erwin, Kevin - Kevin L. Erwin Consulting Ecologist, Inc.
 Estevez, Ernest D. - Mote Marine Laboratory
 Fairbrother, Anne - Ecological Planning & Toxicology, Inc.
 Faust, Charles R. - GeoTrans, Inc.
 Finkl, Charlie W. - Coastal Education & Research Foundation, Inc. (CERF)
 Flick, Reinhard E. - Coastal Environments
 Foltz, Jeffrey W. - Clemson University
 Ford, Dennis E. - FTN Associates, Ltd.
 Fourqurean, James W. - Florida International University
 Fox, Alison M. - University of Florida
 Fox, Phyllis - Fox Environmental Management
 Fraser, Thomas H. - W. Dexter Bender and Assoc.
 Frayer, Warren E. - Michigan Technological University
 Freedman, Paul L. - Limno-Tech, Inc.
 French, Peter N. - Resources Planning Associates, Inc.
 Frost, Thomas M. - Trout Lake Station, Center for Limnology
 Fry, Brian - Florida International University
 Fuller, Wayne A. - Iowa State University
 Gale, Margaret R. - Michigan Technological University
 Gan, D. Robert - Eder Associates
 Gandy, Lisa C. - FTN Associates, Ltd.
 Garrity, Stephen D. - Coastal Zone Analysis
 Gasana, Janvier - Florida International University
 Gatz, Donald F. - Illinois State Water Survey
 Genereux, David - Florida International University
 Gholz, Henry Lewis - University of Florida
 Gilliam, J. Wendell - North Carolina State University
 Gilroy, Edward J. - Independent Consultant
 Ginevan, Michael E. - M.E. Ginevan & Associates
 Glicken, Jessica - Ecological Planning & Toxicology, Inc.
 Goldsborough, L. Gordon - Brandon University
 Gong, Steven W. - CH2M Hill
 Goodwin, Peter - Philip Williams & Associates, Ltd.
 Gore, James A. - Columbus State University
 Gosselink, James G. - Louisiana State University
 Gotway, Carol A. - University of Nebraska
 Grace, James B. - National Biological Survey
 Grebmeier, Jacqueline M. - University of Tennessee/Oak Ridge National Laboratory
 Gu, Binhe - University of Florida
 Guza, Robert T. - Coastal Environments
 Haan, Charles Thomas - Oklahoma State University
 Halfon, Efraim - National Water Research Institute
 Hall, Charles A.S. - State University of New York
 Hall, David W. - KBN Engineering and Applied Sciences, Inc.
 Halls, Joanne - Research Planning, Inc.
 Hamrick, John M. - Virginia Institute of Marine Science
 Hankin, David C. - Humboldt State University

Harcum, Jon - New Mexico State University
 Harris, Steven C. - Clarion University
 Hassett, John P. - State University of New York
 Hayek, Lee-Ann C. - Charles R. Mann Associates, Inc.
 Hayes, Miles O. - Research Planning, Inc.
 Heatwole, Conrad - Virginia Polytechnic Institute and State University
 Heltshe, James F. - University of Rhode Island
 Herricks, Edwin E. - University of Illinois
 Hershey, Anne E. - University of Minnesota-Duluth
 Hill, Walter R. - Oak Ridge National Laboratory
 Hobson, James F. - Technology Sciences Group, Inc.
 Honeycutt, Rodney L. - Texas A&M University
 Howard, Philip H. - Syracuse Research Corporation
 Hughes, Robert M. - U.S. Environmental Protection Agency
 Hungate, Bruce A. - Smithsonian Environmental Research Center
 Hunt, Carlton D. - Battelle
 Hurley, James P. - University of Wisconsin
 Hurst, Richard W. - Chempet Research Corporation
 Ihnat, Jean M. - Downstream Data Services
 Illangasekare, Tissa H. - University of Colorado
 Imhoff, Claudia - Intelligent Solutions, Inc.
 Irlandi, Elizabeth Ann - University of Miami
 Jacobson, Paul T. - Langhei Ecology, LLC
 Ji, Wei - National Wetlands Research Center
 Johns, Grace M. - Hazen and Sawyer
 Jones, Ronald D. - Florida International University
 Jordan, Frank - Jacksonville University
 Kadlec, Robert H. - University of Michigan
 Kapustka, Lawrence A. - Ecological Planning & Toxicology
 Karr, James R. - University of Washington
 Kaufmann, Ronald S. - Rust Environment & Infrastructure
 Kelly, John R. - Battelle
 Kemp, William Michael - University of Maryland
 Kent, David J. - Technology Sciences Group, Inc.
 Kim, Peter S. - Peter S. Kim Associates
 Kimmel, Bruce L. - Oak Ridge National Laboratory
 Klimas, Charles V. - Independent Consultant
 Knight, Allen W. - Coastal Environments
 Knight, Robert L. - CH2M Hill
 Koch-Rose, Marquerite - Florida Atlantic University
 Koptur, Suzanne - Florida International University
 Labadie, John W. - Colorado State University
 Lamberti, Gary A. - University of Notre Dame
 Landing, William M. - Florida State University
 Larrondo-Petrie, Maria M. - Florida Atlantic University
 Law, Beverly E. - Oregon State University
 Leszczynska, Danuta - FAMU-FSU

Levings, Sally - Coastal Zone Analysis
 Lewis, William M. - University of Colorado
 Leyden, Barbara L. - University of South Florida
 Li, Bai-Lian - Texas A&M University
 Lin, Junda - Florida Institute of Technology
 Loehle, Craig - Argonne National Laboratory
 Loftis, Jim C. - Colorado State University
 Loomis, John B. - Colorado State University
 Loucks, Daniel P. - Cornell University
 Lung, Wu-Seng - University of Virginia
 Luo, Yao-Hua - University of Miami
 Lyons, Walter A. - Forensic Meteorology Associates
 MacDonald, Donald D. - MacDonald Environmental Sciences, Ltd.
 Mahadevan, Kumar - Mote Marine Laboratory
 Martin, James L. - ASel Corporation
 Marusak, Rosemary A. - Kenyon College
 Massaro, Edward J. - Duke University
 Maxwell, Tom P. - Chesapeake Biological Laboratory
 Mazumder, Asit - Université de Montréal
 Mazzotti, Frank J. - University of Florida
 McCrodden, Brian J. - Water Resources Management Incorporated
 McDonald, Michael E. - University of Minnesota
 McDowell, William H. - University of New Hampshire
 McIntire, C. David - Oregon State University
 McNeill, Donald F. - University of Miami
 Medine, Allen J. - Water Science and Engineering
 Meffe, Gary K. - Savannah River Ecology Lab
 Meganck, Richard A. - Ecological Planning & Toxicology, Inc.
 Mei, Chiang C. - MIT
 Mendelssohn, Irving A. - Louisiana State University
 Mercado, Raul M. - Rust Environment & Infrastructure
 Mercer, James W. - GeoTrans, Inc.
 Merritt, Richard W. - Michigan State University
 Michel, Jacqueline - Research Planning, Inc.
 Michener, William K. - Jones Ecological Research Center
 Montagna, Paul A. - University of Texas
 Montague, Clay L. - University of Florida
 Morris, James T. - University of South Carolina
 Moss, Marshall E. - Private Consultant
 Mulholland, Patrick J. - Oak Ridge National Laboratory
 Myers, Donald E. - University of Arizona
 Naqvi, Syed Mohammad - Southern University
 Newman, Raymond M. - University of Minnesota
 Ney, John J. - Virginia Polytechnic Institute and State University
 Nicholson, Stuart A. - Private Consultant
 Niu, Xu-Feng - Florida State University
 Nnadi, Fidelia N. - University of Central Florida
 O'Hagan, Anthony - University of Nottingham
 Olson, Jerry S. - Independent Consultant
 Ondov, John M. - University of Maryland
 Oviatt, Candace A. - University of Rhode Island
 Park, Richard A. - Eco Modeling
 Pavlou, Spyros P. - Ensearch Environmental Corporation
 Pearson, Walter H. - Battelle
 Peralta, Richard C. - Utah State University
 Peters, Esther C. - Tetra Tech, Inc.
 Peterson, Charles H. - University of North Carolina
 Philips, Edward J. - University of Florida
 Pielke, Roger A. - Colorado State University
 Pierce, Richard H. - Mote Marine Laboratory
 Pimental, David - Cornell University
 Pimm, Stuart L. - University of Tennessee
 Poduri, S.R.S. Rao - University of Rochester
 Poeter, Eileen - Colorado School of Mines
 Pollman, Curtis D. - KBN Engineering and Applied Sciences, Inc.
 Pomeroy, Lawrence R. - University of Georgia
 Pontius, Jeffrey S. - Kansas State University
 Primack, Richard B. - Boston University
 Prisco, John C. - Montana State University
 Rand, Gary M. - Florida International University
 Randall, Dean - Water Resources Management, Inc.
 Randazzo, Anthony F. - University of Florida
 Rancy, Donald C. - The University of Alabama
 Rao, Srinivas C. - Engineering & Applied Science, Inc.
 Ray, Chittaranjan - Illinois State Water Survey
 Reddy, K.R. - University of Florida
 Reed, David D. - Michigan Technological University
 Reed III, James F. - Lehigh Valley Hospital
 Reid, George Kell - Independent Consultant
 Restrepo, Pedro J. - University of Colorado/Optimal Decision Engineering
 Rice, John A. - Fox Environmental Management
 Riedel, Gerhard F. - The Academy of Natural Sciences
 Roberts, Deborah - Roberts Environmental Consulting, Inc.
 Robillard, Paul D. - Penn State University
 Robson, Douglas S. - Private Consultant
 Rodgers, Paul W. - Limno-Tech, Inc.
 Rogers, Elizabeth I. - White Water Associates, Inc.
 Rogers, John W. - CH2M Hill
 Rogge, Wolfgang F. - Florida International University
 Rossi, Richard E. - Isaaks & Co.
 Russell, Clifford S. - Vanderbilt Institute for Public Policy Studies
 Ryan, Thomas P. - University of Newcastle
 Rykiel, Jr., Edward J. - Battelle
 Sakers, James E. - Florida International University
 Salas, Jose D. - Colorado State University

Samuels, William B. - Science Applications International Corporation
 Saroff, Scott T. - Blasland, Bouck, & Lee, Inc.
 Scarlatos, Peter D. - Florida Atlantic University
 Schaeffer, David J. - EcoHealth Research, Inc.
 /University of Illinois
 Scheffer, Marten - RIZA
 Schell, Jr., John D. - TERRA, Inc.
 Schelske, Claire L. - University of Florida
 Schnoor, Jerald L. - The University of Iowa
 Scholz, Taryn G. - Quality Assurance Associates, L.L.C.
 Schottman, Robert W. - ASci Corporation
 Schroeter, Stephen C. - Coastal Environments
 Schropp, Steven J. - Taylor Engineering, Inc.
 Schwartz, Stuart S. - Interstate Commission on the
 Potomac River Basin
 Scott, Michael J. - Exxon Production Research Company
 Scudlark, Joseph R. - University of Delaware
 Shabman, Leonard - Virginia Tech
 Shafer, John M. - Applied Hydrogeologic Research, Inc.
 Sheer, Daniel P. - Water Resource Management
 Incorporated
 Sheng, Y. Peter - University of Florida
 Sherblom, Paul M. - University of South Florida
 Sherwood, Christopher R. - Battelle
 Shih, Sun-Fu - University of Florida-IFAS
 Shine, Mary-Jo - Private Consultant
 Singer, Robert - Roberts Environmental Consulting, Inc.
 Smart, R. Michael - US Army Corps of Engineers
 Smith, Dennis E. - Desmatics, Inc.
 Smith, Eric P. - Virginia Polytechnic Institute and State
 University
 Smock, Leonard A. - Virginia Commonwealth
 University
 Solo-Gabriele, Helena - University of Miami
 Spalding, Marilyn G. - University of Florida
 Sprinkel, Jay M. - Mote Marine Laboratory
 Srinivasan, Ponniah - GeoTrans, Inc.
 Srinivasan, Raghavan - N.R. Environmental/Blackland
 Research Center
 St. Amand, Ann L. - PhycoTech
 Stanley, Ronald A. - Blackberry Hills Farm
 Stevenson, R. Jan - University of Louisville
 Stocker, Randall Kennedy - University of Florida
 Stoermer, Eugene F. - University of Michigan
 Stone, James A. - Private Consultant
 Stribling, James B. - Tetra Tech, Inc.
 Swart, Peter K. - University of Miami
 Syvertsen, J.P. - University of Florida
 Szmant, Alina M. - University of Miami - RSMAS
 Taylor, Marshall R. - Resource Planning Associates
 Thom, Ronald H. - Battelle
 Thomas, Valerie - Princeton University
 Thornton, Kent - FTN Associates, Ltd.
 Toll, John E. - Ensearch Environmental Corporation
 Tremwel, Terry K. - Independent Consultant
 Trexler, Joel - Florida International University
 Triantis, Konstantinos P. - Virginia Polytechnic Institute
 and State University
 Truitt, Clifford L. - Mote Marine Laboratory
 Turner, R. Eugene - Louisiana State University
 Turner, Ralph R. - Frontier Geosciences Inc.
 Upchurch, Sam B. - ERM-South, Inc.
 van der Valk, Arnold - Iowa State University
 Van Donk, Ellen - Agricultural University Wageningen
 The Netherlands
 Varljen, Mark D. - Applied Hydrogeologic Research,
 Inc.
 Vince, Susan W. - University of Florida
 Voinov, Alexey - University of Maryland
 Waide, Jack B. - FTN Associates, Ltd.
 Walker, Jr., William William - Private Consultant
 Walton, Raymond - West Consultants, Inc.
 Wang, John D. - University of Miami
 Wang, Keh-Han - University of Houston
 Wang, P.F. - Private Consultant
 Ward, David S. - GeoTrans, Inc.
 Ward, Robert C. - Colorado State University
 Warner, James - Colorado State University
 Watras, Carl J. - Environmental Research, Inc.
 Wayne, Peter - Harvard University
 Weinberg, Howard - University of North Carolina
 Weis, Judith S. - Rutgers University
 Weishampel, John F. - University of Central Florida
 Weisner, Stefan E.B. - Lund University
 Wellman, Katharine F. - Battelle
 Wells, Randall S. - Mote Marine Laboratory
 Wendel, Jonathan F. - Iowa State University
 West, Bob - Private Consultant
 Westerdahl, Howard E. - Battelle
 Wetzel, Richard L. - Virginia Institute of Marine Sciences
 Wetzel, Robert G. - University of Alabama
 Whaley, Janet E. - U.S. Army Center for Health
 Promotion and Prevention Medicine
 Whiting, Gary J. - Christopher Newport University
 Wille, Luc T. - Florida Atlantic University
 Williams, Bill A. - Ecological Planning & Toxicology,
 Inc.
 Wilzbach, Margaret A. - Palm Beach County Dept. of
 Environmental Resource Management
 Windom, Herbert L. - Skidaway Institute of
 Oceanography
 Windsor Jr., John G. - Florida Institute of Technology
 Winemiller, Kirk O. - Texas A&M University

Wise, William R. - University of Florida
Wisiol, Karin - Karin Wisiol & Associates
Word, Jack Q. - Battelle
Wu, Jianguo - Desert Research Institute
Wycoff, Ronald L. - CH2M Hill
Yoo, Kyung H. - Auburn University
Youngbluth, Marsh J. - Harbor Branch Oceanographic
Institution
Zhang, Zhiyi - University of North Carolina
Zhu, Chen - GeoTrans Inc.
Zhu, Ming - Dames & Moore

Appendix 3.

Appendix Table 1. A summary of the Expert Assistance projects conducted by the South Florida Water Management District during FY 1996. Projects are presented in ascending order by cost.

EXPERT ASSISTANCE PROJECTS	COST	BENEFITS TO SFWMD
Peer Review: Research Plan: "Plan for Quantifying Long-Term Trends in Lake Okeechobee"	\$1,050	Two experts provided guidance to ensure the credibility of this research plan which deals with quantifying trends in the landscape dynamics, biodiversity and ecological function of Lake Okeechobee.
Everglades Landscape Modeling - Workshop Participant	\$1,200	Integration of the ELM Model (District) and the ATLSS Model (Federal) is being considered since both are complementary in nature and a collaboration would result in an enhanced means for evaluating restoration alternatives. Dr. Thomas Maxwell (U. Maryland) prepared a feasibility evaluation for the linking of the two models.
Kissimmee River Avian Community Evaluation	\$1,976	Dr. Paul DuBowy (Texas A&M University) assisted staff in developing a statistically sound design for an avian community monitoring project in the Kissimmee River floodplain. Birds are one of seven components that have been chosen to evaluate the success of restoration of the river.
Peer Review: "Preliminary Estimate of Optimum Freshwater Inflow to the Caloosahatchee Estuary, Florida"	\$2,174	A team of four experts provided recommendations on estimates of optimum freshwater inflow to meet new schedule demands and allow progress on the "Lower East Coast Water Supply Plan" and "Minimum Flows and Levels" for the estuary.
Peer Review: Work Plans: "Nutrient Exchange Between Florida Bay and the Everglades Salinity Transition Zone" and "Responses of Submersed Macrophytes to Freshwater Inflow to Florida Bay"	\$2,550	Two reviewers provided recommendations to improve these work plans which are designed to increase understanding of the effects of changing freshwater flow on the transition zone and northern Florida Bay. Results from both studies will provide information that will guide future decisions on water deliveries to the Bay.
Governing Board Presentation on the Final Report of the Review Panel on Phosphorus Control in Lake Okeechobee	\$2,931	Dr. Neal Armstrong (U. Texas) presented the findings of the Review Panel on Phosphorus Control in Lake Okeechobee to the Governing Board. Dr. Armstrong served as the Panel Chair.
PC-based Data Animation	\$3,300	Computer animation is a powerful tool for illustrating information generated from mathematical models and other highly technical analyses to a non-technical audience. Dr. Efraim Halfon (National Water Research Institute-Canada) instructed District staff in the preparation and conversion of data for animation.

EXPERT ASSISTANCE PROJECTS	COST	BENEFITS TO SFWMD
Peer Review: "Statement of Technical Issues and a Draft Proposal for Developing Minimum Flows and Levels in the Lower East Coast Planning Area"	\$3,410	A panel of four experts provided recommendations to ensure the scientific soundness of this document which proposes setting minimum flows and levels that would prevent significant harm to the water resources of the area based on the best available information.
Atmospheric Deposition Program: Consultation on Scope of Work for the Working Group on Atmospheric Deposition	\$4,333	The District is reviewing its entire Atmospheric Deposition Program. Dr. Donald Gatz (Illinois State Water Survey) reviewed these activities and made recommendations on revising our program to measure atmospheric deposition with greater accuracy and precision.
Chemairspray - Bioremediation - Expert Consultation	\$4,662	Dr. Spyros Pavlou assisted in representing the District in a potential enforcement settlement concerning risk assessment and long-term cleanup of the Chemairspray site and provided recommendations for long-term cleanup goals.
Florida Bay Interagency Modeling Workshop - Technical Consultant	\$4,673	Dr. Donald Rancey (U. Alabama) served as a technical evaluator to review a hydrodynamic model developed by the US ACOE for Florida Bay and to determine its appropriateness and compatibility with other modeling efforts in the Bay.
Summary of Microbially-Mediated Mercury Aquatic Biogeochemistry in the Everglades - Workshop Participant	\$8,027	In order to increase understanding of mercury bioavailability to microbes and microbially-mediated methylation in the Everglades aquatic environment, Dr. Cynthia Gilmour (Benedict Estuarine Laboratory), participated in a workshop to summarize the information for the District.
Aquatic Metabolism - Kissimmee River / Lake Okeechobee - Open System Measurements	\$8,168	Ecosystem metabolism experiments can validate ecosystem conditions. Dr. Thomas Belanger (Florida Institute of Technology) conducted open system measurements of metabolism to facilitate the calibration of the metabolism chambers.
Seed Bank Composition Along Phosphorus Gradients in WCA2A	\$8,671	A seed bank survey map was developed by Dr. Arnold van der Valk (Iowa State University) along the nutrient gradient in WCA2A. This map will help in determining how widespread cattail seedlings are and will be used to predict vegetation dynamics for landscape modeling.
Revision of Site-Specific Risk Assessment for the Chemairspray Site	\$9,200	Dr. Spyros Pavlou revised the risk assessment for the Chemairspray site by recomputing alternate clean-up goals under various scenarios of site access as suggested by DEP.
Technical Integration Workshop - Facilitator	\$9,536	Drs. Sheer and McCrodden (Water Resources Management, Inc.) facilitated a workshop on ways of bringing together the various departments to develop common methods, consistent data and clear communication pathways.

EXPERT ASSISTANCE PROJECTS	COST	BENEFITS TO SFWMD
Enhance Hydrodynamic Model for Lake Okeechobee	\$9,600	A hydrodynamic model was enhanced by Dr. John Hamrick to simulate external heat fluxes, evaporation and rainfall as they affect the circulation patterns in Lake Okeechobee. Accuracy of predicted circulation patterns directly affects the accuracy of predicted phosphorus concentrations.
A Model to Evaluate Variance in Linear Interpolation - A Manuscript	\$10,938	Linear interpolation has been used extensively by the District to fill in missing data. An expert assisted in developing a procedure to quantify the variance in this interpolation. The application of this procedure will help to quantify the uncertainty in the nutrient load calculations for Lake Okeechobee.
Functional Group Analysis - Invertebrates - Kissimmee River Restoration	\$12,034	Measuring functional attributes of invertebrates is an essential element in the Kissimmee River Restoration Evaluation and is a powerful measure of the integrity of the ecosystem. Dr. Richard Merritt (Michigan State U.) guided staff in the measurement and analysis of this element.
Hobe Sound Basin Study - Model Simulation	\$14,625	A "two-dimensional sheet flow" model (Sheet 2D) was modified and applied to the Hobe Sound Basin area to assist in the development of a plan for flood relief, wetland preservation and stormwater quality concerns.
Review of Sediment Model and Sediment Resuspension/Deposition Processes for Lake Okeechobee	\$15,000	Accurate predictions of sediment resuspension are necessary to correctly model in-lake P processes. The District's most current sediment process model is not reliable and difficult to use. Dr. Chiang Mei (Massachusetts Institute of Technology) provided recommendations for the best approach for the model.
Verification of a Nonlinear Dispersive Wind-Wave Model for Lake Okeechobee	\$15,600	A wind-wave model developed for Lake Okeechobee was verified by Dr. K.H. Wang (U. Houston). Verification of the model will lead to better predictions of suspended sediment concentrations which will improve understanding of water quality dynamics and biological processes.
Aquatic Metabolism - Kissimmee River / Lake Okeechobee - Chamber Experiments	\$16,267	Ecosystem metabolism experiments can validate ecosystem conditions. Dr. James Brock (Rapid Creek Research, Inc.) assisted District staff in the development of a technology using chambers to measure aquatic metabolism. The technique developed for this study will be applicable to other ecosystems.
Software Development - Application for Permit BMP Data Evaluation	\$16,343	Dr. Bernard Engel (Purdue University) developed an end-user software application which can link GIS farm locations with "real-time" permit-submitted data and perform statistical analyses to determine if any direct relationships are evident between P runoff and permitted BMP plans.

EXPERT ASSISTANCE PROJECTS	COST	BENEFITS TO SFWMD
Kissimmee River Restoration Surface Water/Groundwater Interaction Study	\$18,523	Dr. Sam Upchurch (ERM-South, Inc.) assisted staff in developing a groundwater monitoring network designed to monitor groundwater flow and quality before and after restoration of Pool C, where backfilling will take place. Groundwater inputs have been shown to have a detrimental effect on dissolved oxygen levels in the River since channelization.
Development of Parameter Optimization Module for Groundwater Models in the GWZOOM Modeling Environment	\$19,936	An interface module was developed by Dr. Robert Greenwald in the GWZOOM modeling environment for parameter estimation. The interface will allow users to quickly prepare parameter estimation inputs and calibrate groundwater models.
Optimization of Freshwater Inflows to the Caloosahatchee Estuary	\$22,400	Dr. John Labadie (Colorado State U.) developed a model that implements BMPs and storage-release systems within the Caloosahatchee Watershed to establish monthly frequency distribution of freshwater flows to the Estuary to protect the ecosystem, while meeting irrigation demands within the watershed.
Testing the Adequacy of Kriging Models for the Design of Raingauge Networks in the South Florida Water Management District	\$24,289	The validity of kriging methodology, which was used as the basis of an evaluation of the raingauge network, was tested by Dr. Marshall Moss. He tested the inconsistencies of the method before the District actually applied the recommendations.
Pilot Study - Phytoplankton Nitrogen Dynamics in Lake Okeechobee	\$24,507	Dr. Claire Schelske (U. Florida) demonstrated the utility of ¹⁵ N stable isotopes for quantifying phytoplankton N dynamics in the Lake. Lack of information on phytoplankton N dynamics was considered to be a major deficiency in the development of predictive tools for Lake response to nutrient loading and water level regulation.
Caloosahatchee Estuary - Benthic Invertebrate Identifications	\$24,860	Benthic organisms are a critical component in determining optimum flow ranges. A benthic invertebrate taxonomist, Jim Coulter (Mote Marine Laboratory), conducted identifications of 192 samples to assist in establishing minimum/maximum freshwater inflow limits to the Caloosahatchee Estuary.
TOTAL for FY 1996	\$320,783	

